

TRENDS IN ELECTRONIC BANKING IN THE CZECH REPUBLIC

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Abstract: In recent years, the revolutionary technological advances have caused a substantial development in payment systems, not only in the Czech Republic, but all over the world. The Internet and other wireless communication technologies have not only changed the existing payment systems, they have even generated new ways and methods of providing banking services. This article focuses on the dynamics of the electronic banking in the CR. The goal of this paper is to track the latest trends in the electronic banking in the Czech Republic, and to detect the very near future of it. The paper focuses on the process of the replacement of the traditional brick-to-mortar banking by the click-to-mortar banking, and the replacement of cash transactions by cashless payments.

Keywords: electronic banking, payment cards, e-payments, m-payments, phone banking, GSM banking, home banking, internet banking.

Introduction

Financial services are now offered through a multitude of delivery channels, from traditional brick-and-mortar branches to wireless devices. Access devices are becoming many customers' first point of contact with financial services, rather than a teller or branch. The Internet and wireless communication technologies are dramatically changing the structure and nature of financial services, they are more than just new distribution channels, they are a different way of providing financial services. [1]

The aim of this article is to analyze the current trends of electronic banking in the Czech Republic, on the basis of foundations concerning evolution of the electronic banking, and own investigations of the current situation in this area. The paper will also track the latest trends and possible future of electronic banking in the Czech Republic.

Methodology used in this article encompasses a literature review, an analysis of the current situation on the electronic banking market in the Czech Republic, a comparison of selected indicators to the European Union, and own survey among the Czech banks concerning provided financial services.

1 Evolution of the electronic banking

Electronic banking (e-banking) in its very basic form can mean the provision of information about bank and its services via a home page on the World Wide Web (WWW). More sophisticated e-banking services provide customer access to accounts, the ability to move their money between different accounts, and making payments or applying for loans via e-Channels. [2]

E-banking is one form of e-commerce. Kalakota defines e-commerce as the delivery of information, products and services, or payments over telephone lines, computer networks, or any other electronic means. [3]

Some authors take for the very beginning of electronic banking the first credit card which was issued by the Western Union Telegraph Company in 1914. But generally we can say that electronic banking offers new ways for consumers to access their account balances, transfer funds, pay bills, and buy goods and services without using cash, nor even leaving home. So from this point of view, electronic banking, as a method of remote access to the bank account, has started with the home banking. Home banking began in the mid-1970s with the desire to reduce back-office check processing costs through bill payment. The first home banking system offered consumers the ability to make payments using offline applications, and used voice response technology to minimize personnel costs. Home banking service was based on the combination of a personal computer and modem.

On-line banking based on the World Wide Web [4] was first introduced in the early 1980s, when four major banks offered home banking services: Citibank, Chase Manhattan, Chemical, and Manufacturers Hanover. At this time, most home banking services with many different menus, lots of verification procedures and problems with remote communication, were very difficult to use. These e-banking services were mostly offered by traditional banks as a supplementary service and remote access to current or savings accounts.

At the beginning of 1990s, the first pure Internet bank Security First Network Bank was established in the USA. It was the first virtual bank which offered its services without stone bank branches. This process is often called as a shift from a brick-and-mortar to a click-and-mortar business. The term has been used since the development of e-commerce. [5]

Systems has changed and got more sophisticated, so nowadays electronic banking enables users not just to check current account balances and transfer funds among account, but many other miscellaneous services.

The combination of physical and web channels is currently a typical electronic commerce business model, applied even for the banking sector. Electronic commerce researchers use terms like "click and mortar" (see above), "bricks and clicks", "surf and turf", "cyber-enhanced retailing", or "hybrid e-commerce". [5]

2 Current trends in the electronic banking

To track the recent trends in electronic banking may appear as an interminable task. The current development of electronic wireless technologies, together with economic globalization, advances in telecommunications, improvement and invention of new financial products, etc. cause that the findings can become outdated very quickly.

The use of ICT (Information and Communication Technologies) in the Czech Republic

According to statistics of the Czech Statistical Office from 2010 and 2011, almost 65 per cent of the Czech population older than 16 years used computers (2.7 million households), and 62 per cent of them used the Internet (2.5 million households). As for the ownership of the personal computers, 59 per cent of the Czech households own one or more PCs, which is twice as much as in 2005. [6]

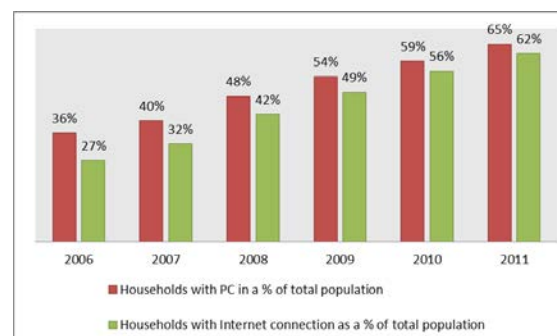


Fig. 1: The use of ICT by households in the Czech Republic
Source: Czech Statistical Office [7], own elaboration

The following figure shows the rapid development in the Internet access facility of the Czech households from 2006 (the Internet access was available only for 29 % of households in the Czech Republic) to 2010 (60 % of households). In comparison to the situation of the whole European Union, in the given period the growth was more perpendicular in the Czech Republic. Whereas in 2005 the Czech Republic was far below the average

of the EU in the field of Internet access, in 2010 it almost reached the level of the EU average Internet access facility.

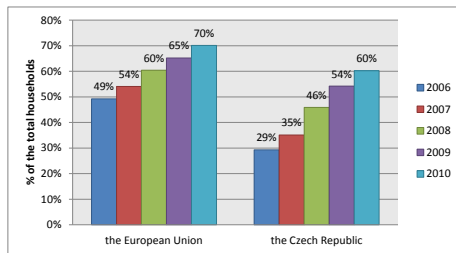


Fig. 2: Proportion of households with the Internet access (% of total households)

Source: Czech Statistical Office [8], own elaboration

3 Categorization of the electronic banking

The report of the European Commission called the Green Book published in January 2012 categorizes the instruments of electronic banking into three main groups: payment cards, e-payments and m-payments.

Payment cards are the most common and the most often used electronic payment instrument for retail payments. In terms of number of transactions, the payments by debit or credit cards accounted almost one third of all retail payments in 2009. In the EU (the CR), the total number of issued payment cards was about 726 million (9.3 million), which is 1.45 (0.89) card per inhabitant. [9]

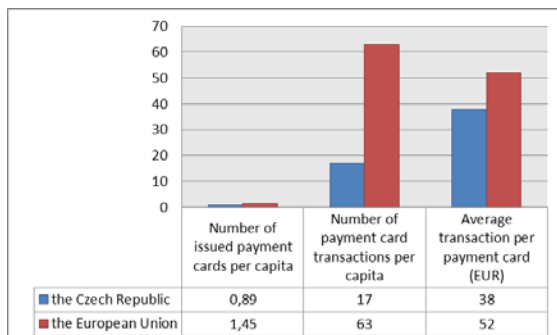


Fig. 3: Payment card statistics in the EU and the CR

Source: European Commission [9], own elaboration

E-payments are payment transactions carried out via the Internet. There are three basic types of e-payments:

- internet payment by a payment card,
- internet banking (payment order or direct debit),
- payments through the e-payments providers (also called electronic wallet, or purse).

M-payments are payments where the payment details and instructions are entered, transmitted or confirmed via mobile phone or similar electronic device. There are two main categories:

- remote m-payments based on WAP or SMS services,
- contactless payments based on the technology of the Near Field Communication.

4 Electronic banking in the Czech Republic

At present, electronic banking in the Czech Republic includes mainly Internet Banking, Home Banking, Phone Banking, WAP Banking, PDA Banking and Mobile Banking. In 2011, the contactless payments were introduced in the Czech Republic.

Phone banking belongs among the first systems of remote access communication with the bank. This system allows operation of banking services over the telephone with touch tone dialing, or

the mobile phone. Phone banking uses either a computerized system where options are chosen by pressing numbers on the phone key pad and communication is based on the automated voice system. The second option of the phone banking is the communication with a telephone banker who provides the same services as the bank clerk at the counter. An authentication into the phone banking system is made by the identification number and the personal identification number (PIN). As the number of landline users falls, the popularity of the telephone banking declines. Many of the Czech banks still offer the services of telephone banking.

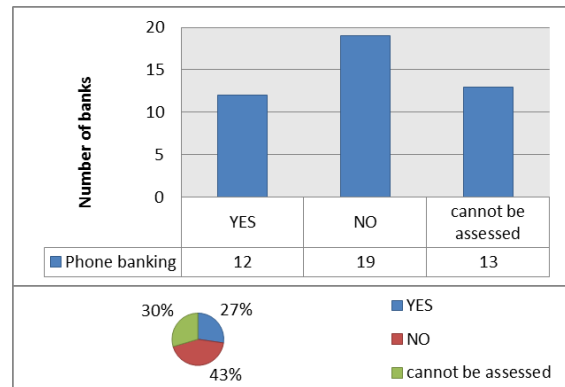


Fig. 7: Phone banking (any type) provided by banks in the Czech Republic

Source: own investigation among 44 Czech banks, status of February 17, 2012

The growing popularity of smart phones and other portable Web-enabled devices such as tablets has skyrocketed banking via mobile phones in recent years. There are several ways of mobile phone banking: SMS messaging, mobile web banking, GSM banking, JAVA banking, and applications developed for iPhone, Android or Blackberry devices – mobile internet banking.

SMS banking (SMS stands for short message service) is a technology-enabled service that allows customers to make simple actions to their bank accounts by sending and receiving text messages. The users of SMS banking need to register first, and verify their phone numbers with their banks. Some banks use an authentication calculator for the higher security. SMS messages must be sent in exactly defined format, for example texting "Bal" will obtain the account balance. [10]

GSM banking as the next mobile banking technology is based on the application built into the SIM card – SIM Toolkit (SIM stands for Subscriber Identity Module). SIM Toolkit provides encryption of SMS messages. GSM banking application creates an encrypted message that can be decrypted only by software of the bank. Misuse of this system is eliminated just because encrypting.

Mobile web banking or WAP banking (Wireless Application Protocol) is similar to online account access from a home-based computer. It is a combination of a phone and internet banking. This system allows various banking transactions simply by logging into the user's account via a mobile web browser. WAP banking though didn't achieve much success, because in comparison to other communication channels it is slow, costly and complicated technology. [11]

JAVA banking allows clients to control their accounts online in a quality that brings Internet banking. The access to the banking products is performed throughout a programming language Java. Communication between the client and the bank is based on the data transfer. In comparison to GSM Banking, the bank is not limited in the range of provided services that can be run via Java banking.

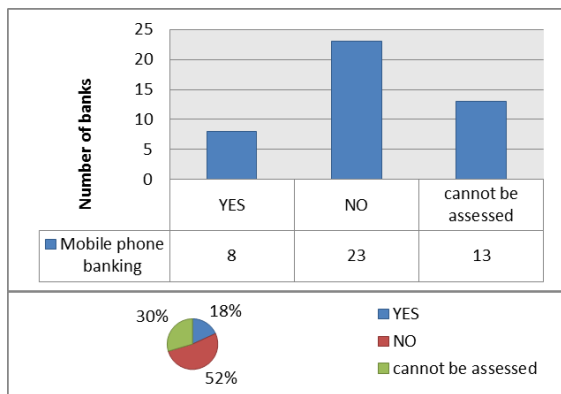


Fig. 8: Mobile phone banking provided by banks in the Czech Republic

Source: own investigation among 44 Czech banks, status of February 17, 2012

Home banking was most popular till the end of the last century, when it was fundamentally replaced by Internet banking. Home banking is used today primarily by corporate clients who take the advantage of these products, which is compatibility with other financial and economic software programs. Home banking allows contact with the bank via a special software program which allows almost all transactions with the current account without on-line connection to the Internet. An authentication is made by a certificate, using usually an encrypted SSL connection. The biggest disadvantage of home banking systems is that they can only be used on the computer where the special banking software is installed.

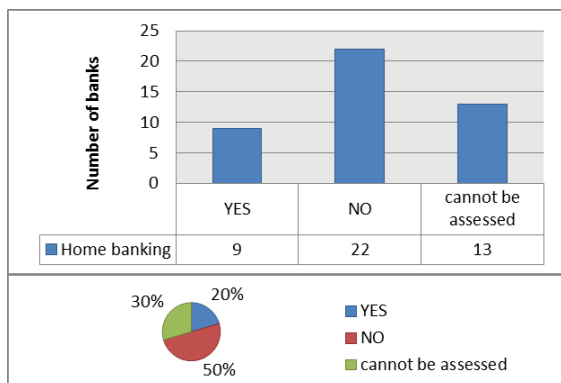


Fig. 4: Home banking provided by banks in the Czech Republic

Source: own investigation among 44 Czech banks, status of February 17, 2012¹

Internet banking can eliminate above mentioned disadvantage, because this service allows communication with the bank from anywhere in the world and on any computer with the Internet connection. It is necessary to log on the bank's web page, enter a user name and certification code, and to carry out operations with the account. An authentication of Internet banking operations depends on the particular bank, but generally is used the username and password, a certificate, SMS authentication, or PIN calculator.

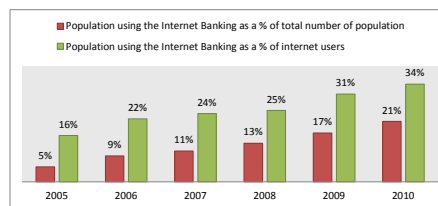


Fig. 5: Population using internet banking in the Czech Republic

Source: Czech Statistical Office [12], own elaboration

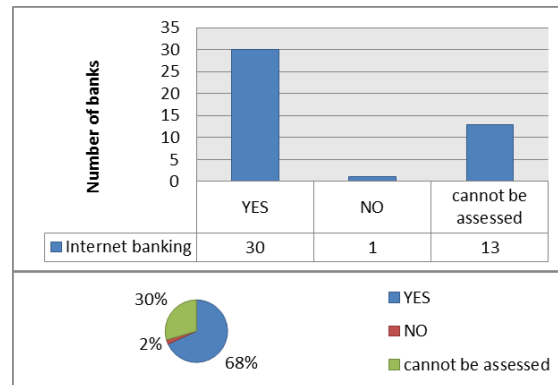


Fig. 6: Internet banking provided by banks in the Czech Republic

Source: own investigation among 44 Czech banks, status of February 17, 2012

Mobile Internet banking, also Smart banking is based on the mobile banking applications for Android, iPhone or Blackberry mobile phones ("smart" phones). These applications connect the user directly to the bank server for complete banking functionality without having to navigate a mobile web browser. Mobile Internet applications can be downloaded either through the bank's website or through the iTunes store, like Android Market. Smart banking applications offer also services which are not directly related to the banking and payments, like ATM or branch location, or information on various benefits and discounts in stores.

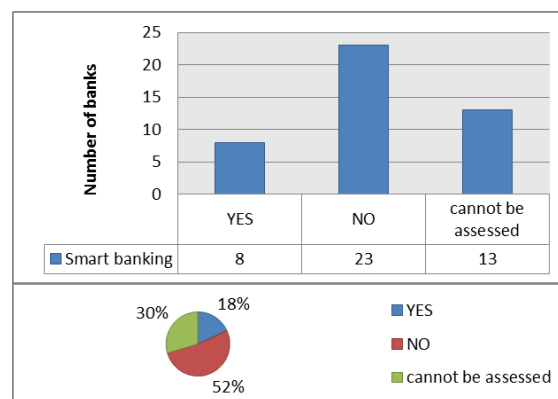


Fig. 9: Smart banking provided by banks in the Czech Republic

Source: own investigation among 44 Czech banks, status of February 17, 2012

Contactless payments are based on the technology of Near Field Communication. Contactless payments were first introduced in Great Britain in 2007, in the Czech Republic in 2011. Currently this is still relatively short period for massive expansion of this technology. According to own investigation, this service is

¹ The use of particular electronic banking service could not be assessed by building societies and the Czech Export Bank

offered by two banks to date, but the other banks prepare enter to the market of contactless payments soon.

Time saving is seen as the biggest advantage of the contactless payments. While processing a cash transaction takes an average of 34 seconds, and a pin transaction 27 seconds, the contactless payments typically take only 12.5 seconds. [13] This is the reason why it is supposed that contactless payments will gradually replace the use of physical cash for small purchases. The contactless payments represent the challenge especially for merchants who haven't offered credit card payments yet (such as fast foods, tobacco shops, parking places, public transport etc.).

The trends in the Czech Republic concerning electronic banking can be monitored also in the table 1. The total number of current accounts of households has increased from 7.940 thousands in 2008 to 9.001 thousands in 2010. The number of current accounts with any type of electronic payment instrument (payment cards, Internet or Telephone banking) has also substantially increased, whereas the number of accounts without any electronic access has decreased. [14]

Tab. 1: Number of the current accounts of households in the CR

Current accounts of households (in thousands)	2008	2009	2010
Total amount of accounts	7.940	8.433	9.001
Current accounts with issued payment cards	5.771	5.984	6.199
Current accounts with access via the Internet	3.588	4.393	5.282
Current accounts with access via a telephone	3.247	3.658	4.072
Current accounts without any electronic access	1.097	1.046	974

Source: Czech National Bank [14], own elaboration

Shift from brick-to-mortar banking to the click-to-mortar banking

This part of the article deals with the hypothesis that the traditional brick-to-mortar banking is gradually replaced by the click-to-mortar banking, and that the cash transactions are replaced by cashless payments.

The costs of financial services provided through traditional financial channels (like branches, or landline telephones) seem to be higher than costs of modern financial services based on wireless Internet communication systems (like ATMs, PC banking, Internet banking applications). Claessens states that a typical customer transaction through a branch or phone call costs about 1\$, but that transaction costs just \$0.02 online (Figure 10). [1]

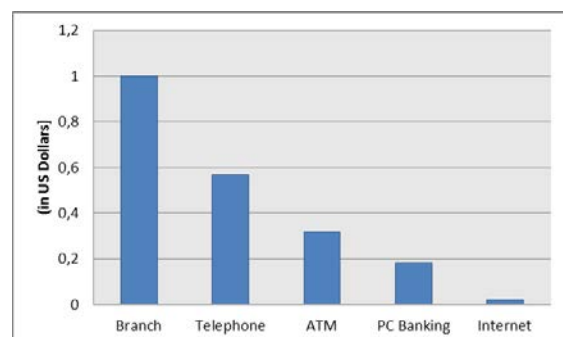


Fig. 10: The marginal cost of a standard financial transaction through different delivery channel

Source: Electronic Finance [1]

It is not just economies of scale in the production of financial services that prove the shift from brick-to-mortar banking to the click-to-mortar banking. The manners of the bank customers

have also significantly changed. The bank clients got used to modern technologies that have simplified their ordinary private or corporate payments. Nevertheless it is not expected that the brick branches of the banks completely disappear. It is rather expected that the structure of services provided by stone bank branches will be modified, and more specialized consulting services from the financial sector will be offered.

In the Czech Republic, there can be found kind of synergy of the brick-to-mortar banking and the click-to-mortar banking. As evidenced in previous text, most of the Czech banks offer some kind of electronic channels or instruments. Even the new banks that as supposed to be pure virtual - based on internet and phone banking, and low transaction cost, build a network of physical financial advisors situated for example in shopping centers. The first virtual bank in the CR was introduced in 2007.

5 Future of the electronic banking

It is very difficult to predict the future of electronic banking. The next developments in electronic banking will probably involve new products and services that were not feasible in traditional banking models.

In some countries of the North and South America, Europe, and Asia, biometrics technology is already being used in banking industry. *Biometric technologies are automated methods of verifying or recognizing the identity of a living person based on a physiological or behavioral characteristic. Examples of physiological and behavioral characteristics currently used for automatic identification include fingerprints, voice, iris, retina, hand, face, handwriting, or finger shape.* [15] Biometrics in banking has a potential for use as a protection against both external and internal fraud.

Digitization and computerization in the financial institutions brings the challenge of paperless banking which is based on online account opening, maintenance, bill payment, etc. The goal is to prevent paper from entering any banking process. [16] Paperless banking technologies can generate savings for the bank and the customer, so they raise efficiency bank-wide. Environmental benefits are also significant.

One of the fastest-growing technologies in coming years is cloud computing. Cloud computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the data centers that provide those services Software as a Service (SaaS). [17] This trend is no more a dominant just of IT corporations, but more and more financial institutions invest in the cloud infrastructure. Banks must consider to a significantly greater extent issues concerning data confidentiality, security, regulatory compliance, and quality of services. Besides cost saving, which is one of the most important benefits of cloud banking, clouds can offer an unlimited capacity and flexibility to continuous development of innovative products, services and channels.

Conclusion

The Internet and other wireless communication technologies have changed the world around us, including banking services and payment channels. This paper was focuses on the dynamics of the electronic banking in the Czech Republic in recent years, on the trends of electronic banking, and assumptions of the future development of electronic finance.

The current expansion of electronic wireless technologies, together with the rapid growth of computer and Internet facilities of the Czech households, lead to massive expansion of electronic banking services. Most of the Czech banks offer one or more types of electronic banking products, which include particularly payment cards, e-payments and m-payments.

The transition from traditional brick-to-mortar banking to so called click-to-mortar banking is an indisputable global trend, but this trend should to be seen more like a direction than like a

destination. It can be stated that the cash transactions are gradually replaced by cashless payments.

The next developments in electronic banking will probably involve new products and services that were not feasible in traditional banking models. The future of electronic banking has no limits, banks just must consider to significantly greater extent issues concerning data confidentiality, security, regulatory compliance, and quality of services. The future of electronic banking will probably include paperless banking, biometrics technologies, and cloud technologies.

Literature:

- [1] Claessens, S., Glaessner, T., Klingebiel, D.: Electronic Finance: Reshaping the Financial Landscape around the World. In: *Journal of Financial Services Research*. Springer Netherlands, 2002, vol. 22, iss. 1, pp. 29-61. ISSN 0920-8550.
- [2] Shah, M., Clarke, S.: *E-Banking Management*. 1st ed., London: IGI Global, 2009. 299 p. ISBN 978-1-60566-252-7.
- [3] Kalakota, R., Whinston, A.B.: *Electronic Commerce: A Manager's Guide*. 1st ed., New York: Addison-Wesley, 1997. 432 p. ISBN 0-201-88067-9.
- [4] Cronin, J. M. (Editor): *Banking and finance on the Internet*. 1st ed., New York: Wiley, 1997. 352 p. ISBN 978-0-471-29219-7.
- [5] Steinfield, Ch. Understanding Click and Mortar E-commerce Approaches: A Conceptual Framework and Research Agenda. In: *Journal of Interactive Advertising*, American Academy of Advertising, 2002, vol. 2, iss. 2, pp. 1-10, ISSN 1525-2019.
- [6] ČSÚ: *Na internet je připojeno 62 českých domácností ze sta – tisková zpráva z 29.11.2011* [online]. Praha: Czech Statistical Office, 2011-11-29 [cit. 2012-03-12]. Press release from November 29, 2011 (PDF). Available from WWW: <http://www.czso.cz/csu/tz.nsf/i/na_internet_je_pripojeno_62_ceskych_domacnosti_ze_sta20111129>.
- [7] ČSÚ: *Využívání informačních a komunikačních technologií v domácnostech a mezi jednotlivci* [online]. Praha: Czech Statistical Office, 2011-11-30 [cit. 2012-04-10]. Statistics 2005-2010. Využívání ICT v domácnostech (XLS). Available from WWW: <http://www.czso.cz/csu/redakce.nsf/i/domacnosti_a_jedn_otlivci>.
- [8] ČSÚ: *Využívání informačních a komunikačních technologií v domácnostech a mezi jednotlivci* [online]. Praha: Czech Statistical Office, 2011-11-30 [cit. 2012-04-10]. Statistics 2005-2010. Využívání ICT v domácnostech (XLS). Available from WWW: <http://www.czso.cz/csu/redakce.nsf/i/domacnosti_a_jedn_otlivci>.
- [9] Evropská komise: *Zelená kniha: Na cestě k integrovanému evropskému trhu plateb prováděných kartou, přes internet a pomocí mobilního telefonu* [online]. Brusel: Evropská komise, 2012-11-01 [cit. 2012-04-11]. Text with EEA relevance (PDF). Available from WWW: <<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0941:FIN:CS:PDF>>.
- [10] MÁČE, M.: *Platební styk – klasický a elektronický*. 1st ed., Praha: Grada, 2006. 220 p. ISBN 80-247-1725-5.
- [11] GRUBLOVÁ, E., et al.: *Internetová ekonomika*. 1st ed. Ostrava: Repronis, 2008. 88 p. ISBN 80-7201-310-6.
- [12] ČSÚ: *Využívání informačních a komunikačních technologií v domácnostech a mezi jednotlivci* [online]. Praha: Czech Statistical Office, 2011-11-30 [cit. 2012-04-10]. Statistics 2005-2010 Využívání ICT jednotlivci (XLS). Available from WWW: <http://www.czso.cz/csu/redakce.nsf/i/domacnosti_a_jedn_otlivci>.
- [13] *Barclaycard enables contactless payments at London's Wembley Arena* [online]. London: Barclays, 2010-12-14 [cit. 2011-04-13]. Press release. Available from WWW: <<http://group.barclays.com/News/Barclays-news/NewsArticle/1231785039035.html>>.
- [14] ČNB: *Zpráva o výkonu dohledu nad finančním trhem v roce 2010* [online]. Praha: Czech National Bank, 2011-06-09 [cit. 2011-04-13]. (PDF). ISBN 978-80-87225-31-8 Available from WWW: <http://www.cnb.cz/cs/dohled_financni_trh/souhrnne_inf_ormace_fin_trhy/zpravy_o_vykonu_dohledu/index.html>.
- [15] WAYMAN, J., et. al.: *An Introduction to Biometric Authentication Systems*. 1st ed. Springer, 2005. 370 p. ISBN 978-1-85233-596-0.
- [16] TRAFTON, J.: *Paperless Banking – The Dream is Real*. 2011. Available from WWW: <<http://cocc.com/paperless-banking.html>>.
- [17] AMBRUST, M., et. al.: A view of cloud computing. In: *Communications of the ACM*, ACM New York, 2010, vol. 53, iss. 4, pp. 50-58, ISSN 0001-0782.

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